

Physical and Dynamical Studies of 1996 PW

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The peculiar object 1996 PW has attracted a great deal of attention because of its very high eccentricity, the observed lack of coma, and the initial reports indicating bluer-than-solar colors (IAUC 6452). Such an object is an excellent candidate to be an extinct cometary nucleus, such as 3200 Phaethon. A preliminary examination of recently obtained broad band colorimetry shows 1996 PW to be a reddish D-type object. Unfortunately, such a color determination does not clearly separate asteroids from comets. Many Jovian Trojan asteroids, a handful of outer-main-belt asteroids, and a few short period comets like Arend-Rigaux and Neujmin 1 all share the D-type spectrum, though 1996 PW is considerably larger than the typical short period comet, with an estimated diameter of 20 km. In this paper, we will present our visible colorimetry, and we will also examine the potential origins of 1996 PW's extreme orbital eccentricity. If one assumes an asteroidal origin for 1996 PW, then its eccentricity is likely due to a previous encounter, presumably with Jupiter. An attractive asteroidal origin for 1996 PW is Jupiter's Trojan cloud. An object "leaking" out from the Trojan cloud could quickly encounter Jupiter, and be perturbed into a highly elliptical orbit. Preliminary integrations show that 1996 PW has not had a planetary encounter within the last 3,000 years, however. Longer integrations must await an improved orbit determination, which should be available by the time of the meeting.

Abstract submitted for 1996 DPS meeting

Date submitted: LPI electronic form version 5/96

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